

WE CLAIM:

1. A method for producing a stable dilute composition, said composition selected from the group consisting of hypohalous acid, hypohalous acid salt, and combinations thereof, said method comprising the steps of:
  - a. providing a source of active material from the group consisting of hypohalous acid, hypohalous acid salt, hypohalous acid generating species, hypohalous acid salt generating species, and combinations thereof;
  - b. diluting said source with purified water to give said stable dilute composition;
  - c. wherein said stable dilute composition has an available chlorine concentration of between 1.0 ppm to about 1200 ppm.
2. A method for producing a stable dilute composition, said composition selected from the group consisting of hypohalous acid, hypohalous acid salt, and combinations thereof, said method comprising the steps of:
  - a. preparing a first solution having an active halogen content of greater than about 0.5% as available chlorine; and
  - b. diluting said first solution with purified water to give a second solution;
  - c. wherein said second solution has an available chlorine concentration of between 1.0 ppm to about 1200 ppm; and
  - d. wherein said second solution retains at least 90% of the available chlorine concentration at a storage temperature of 70°F over 27 days.
3. The method of claim 2, wherein said second solution further retains at least 70% of the available chlorine concentration at a storage temperature of 120°F over 30.7 days.
4. The method of claim 2, wherein said second solution has a pH greater than pH 5 and less than pH 10.
5. The method of claim 2, wherein said second solution has a pH greater than pH 5 and less than pH 9.
6. The method of claim 2, wherein said second solution has a pH greater than pH 5 and less than pH 8.

7. The method of claim 2, wherein said second solution has a pH greater than pH 5 and less than pH 7.
8. The method of claim 2, wherein said second solution has a pH greater than pH 6 and less than pH 8.
9. The method of claim 2, wherein said second solution has an available chlorine concentration of less than 800 ppm.
10. The method of claim 2, wherein said second solution has an available chlorine concentration of less than 500 ppm.
11. The method of claim 2, wherein said second solution has an available chlorine concentration of less than 200 ppm.
12. The method of claim 2, wherein said second solution has an available chlorine concentration of less than 100 ppm.
13. The method of claim 2, wherein said second solution has an available chlorine concentration of less than 80 ppm.
14. The method of claim 2, wherein said second solution has an available chlorine concentration of less than 40 ppm.
15. The method of claim 2, wherein said second solution has a viscosity of from 40 to 10,000 cps.
16. The method of claim 2, wherein said purified water is prepared by a process selected from the group consisting of sodium cation exchange, hydrogen cation exchange, reverse osmosis, activated carbon treatment, UV light treatment, ultrafiltration, nanofiltration, electrodialysis, and a combination thereof.
17. The method of claim 16, wherein said purified water is prepared by an ion-exchange process.
18. The method of claim 17, wherein said purified water is prepared by an ion-exchange process followed by treatment with a process selected from the group consisting of activated carbon, UV light, and a combination thereof.
19. The method of claim 2, wherein said second solution comprises less than about 100 ppb copper, less than about 10 ppb nickel, less than about 30 ppb cobalt, and less than about 500 ppb of total organic carbon.
20. The method of claim 2, wherein said second solution is used to treat allergens.

21. The method of claim 2, wherein said second solution is used to treat surfaces selected from the group consisting of hard surfaces, food contact surfaces, hospital surfaces, food surfaces, kitchen surfaces, bathroom surfaces, human surfaces, tumor cells, skin surfaces, animal surfaces, military equipment, transportation equipment, children's items, plant surfaces, seeds, outdoor surfaces, soft surfaces, air, wounds, medical instruments, and combinations thereof.
22. A method for producing a stable dilute composition, said composition selected from the group consisting of hypohalous acid, hypohalous acid salt, and combinations thereof, said composition comprising the steps of:
- preparing a first solution having an active halogen content of greater than about 0.5% as available chlorine; and
  - diluting said first solution with purified water to give a second solution;
  - wherein said second solution has an available chlorine concentration of between 1.0 ppm to about 1200 ppm; and
  - wherein said second solution has a pH greater than pH 5 and less than pH 8.
23. The method of claim 22, wherein said first solution additionally comprises a pH adjusting agent to achieve said pH range.
24. The method of claim 23, wherein said first solution comprises a pH adjusting agent selected from the group consisting of carbon dioxide, alkali metal carbonate, alkali metal bicarbonate, alkali metal silicates, alkali metal hydroxide, alkali phosphate salt, alkaline earth phosphate salt, alkali borate salt, hydrochloric acid, nitric acid, sulfuric acid, alkali metal hydrogen sulfate, acetic acid, other carboxylic acids, polycarboxylates, organic sulfonic acids, sulfamic acid, and mixtures thereof.
25. The method of claim 22, wherein said purified water comprises a pH adjusting agent to achieve said pH range.
26. The method of claim 25, wherein said first solution comprises a pH adjusting agent selected from the group consisting of carbon dioxide, alkali metal carbonate, alkali metal bicarbonate, alkali metal silicates, alkali metal hydroxide,

alkali phosphate salt, alkaline earth phosphate salt, alkali borate salt, hydrochloric acid, nitric acid, sulfuric acid, alkali metal hydrogen sulfate, acetic acid, other carboxylic acids, polycarboxylates, organic sulfonic acids, sulfamic acid, and mixtures thereof.